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Standard Digital Signal Processing Trainer

DSPLAB Ⅱ

HANBACK ELECTRONICS
Since 1984

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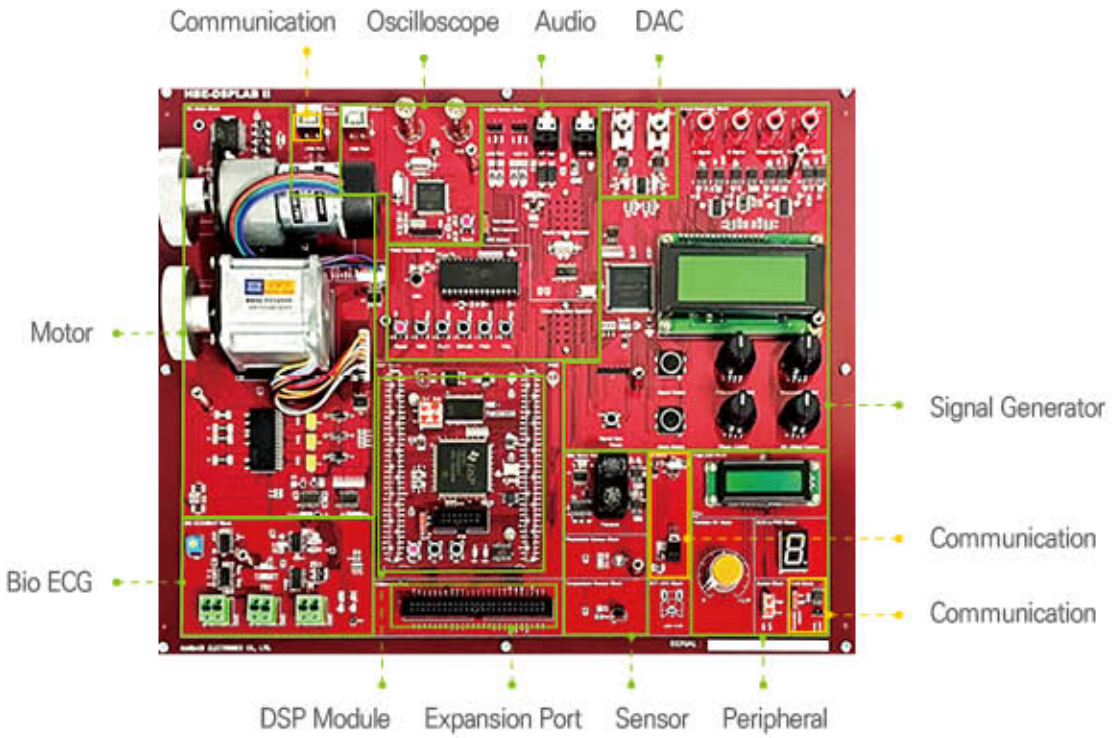
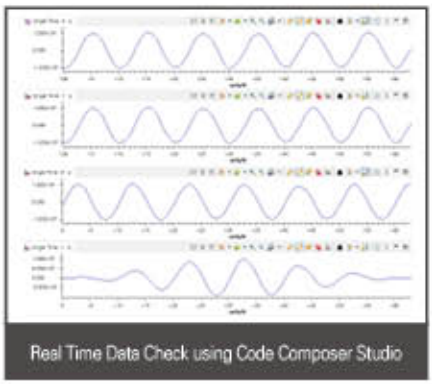


Software Specifications

Programming Environment using Code Composer Studio



Real Time Data Check using Code Composer Studio

- Mounted TI's TMS320F28335
- Code Composer Studio program Development Environment
- Various Signal Processing Experiments of Voice and Bio signal
- Built-in Function generator
- Built-in 2 Channel PC Based Oscilloscope for signal measurement
- Provide Sample program sources for experiments

Basic Experiment List

1. Program Development Experiment using Code Composer Studio IDE
2. Digital measurement and control Experiment with GPIO
3. Interrupt Experiment
4. ADC measurement control Experiment
5. Communication Experiment : SCI, CAN, I2C, McBSP, SPI
6. Standalone Flash programming
7. Measuring Analog and Digital signal
8. DC motor measurement control
9. BLDC motor measurement control
10. Bio ECG bio signal measurement control
11. FIR and IIR filter Design
12. Composite Signal Filtering
13. Noise Filtering
14. Frequency analysis by FFT
15. Voice Signal Measuring and Signal Processing

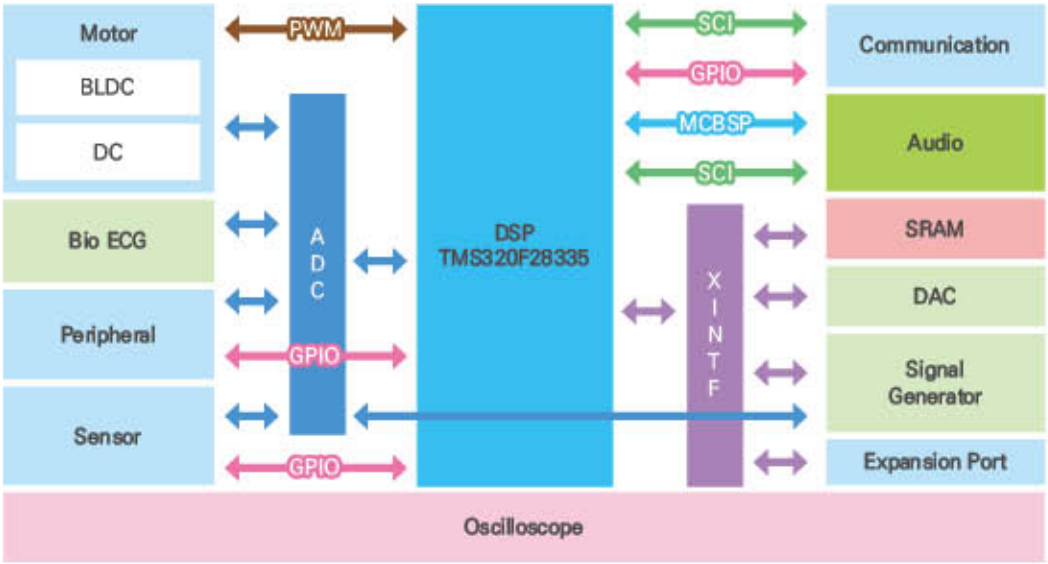
Hardware Specifications

Items		Description
DSP Module	DSP	TMS320F28335 Device - High-Performance 32bit CPU - Six Channel DMA Controller - On-Chip Memory : 256k x 16 Flash, 34k x 16 SARAM - Boot ROM(8k x 16) - 12 Bit ADC, 16 Channel
	SRAM	1Mbit(64k x 16bit), Switch 2ea, LED 2ea, JTAG port
Peripheral	2pole DIP Switch 1ea	
	BCD to FND 1ea	BCD value to 7-Segment display
	16 x 2 Text LCD 1ea	E, RS, 4bit Data
	Variable DC	0 ~ +3.3V variable DC input
	Ext ADC RCA Port	External 0 ~ +3.3V range Signal input
DAC	2CH, 10MHz speed Digital to Analog Converter per a channel	
Signal Generator	Sig A, Sig B, Mixer, Mod	Connected with each signal output RCA port and ADC block of DSP
	Text LCD	Set output signal value display
	Switch	Output signal set Switch and Initialization Switch
	Waveform Generator	Waveform output set to Sig A, Sig B port
	Waveform	Select of Sine, Triangle, Square waveform
	Frequency	Select of 1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k output frequency
	Amplitude	Select from 0Vp-p to 10Vp-p by 0.5Vp-p unit
	Phase	Select to 345° at intervals of 15°
	Bias	Select of -5V ~ +5V by 0.5V level unit
	Mixing Signal	Signal Output from Audio Codec to Mixer port -Audio signal output - Mixing Signal Output of Sig A and Audio signal - Mixing Signal Output of Sig B and Audio signal - Mixing Signal Output of Audio Signal, Sig A and Sig B
	Modulation Signal	Modulation signal output of Sig A or Sig B with Set Frequency to Mod port - Modulation Signal Output of Sig A and Frequency - Modulation Signal Output of Sig B and Frequency - Modulation Signal Output of Mixing signal of Sig A and Sig B and Frequency
Sensor	Photo Diode 1EA, Temperature Sensor 1EA : LM35D, Ultrasonic Sensor 1set : Transmit /Receive Block	
Bio ECG	ECG signal and Beat signal Measurement Block, Cable and Measuring Terminal included for Measurement	
Communication	CAN Transfer Block, IR Transmit /Receive Block, USB to Serial Block : Serial Communication Block	
Motor	DC Motor Block	+12V DC Geared/Encoder Motor, DC Motor Drive Block, PWM control, Encoder input
	BLDC Motor Block	+12V Brushless DC Motor, BLDC Motor Drive Block, 3 phase PWM control, Hall Sensor input, Sensorless control
Audio	Voice Recorder	SD1760P, 60 seconds recoding (8kHz Sampling), Reset, Record, Play, Erase, Forward, Volume Switch MIC. input speaker output (connected to MIC In of Audio Codec)
	Audio Codec	TLV320AIC23, MIC in, HP Out Connector, Line IN, Line Port, Can be used for input source
Oscilloscope	2 CH, ±16V measuring range, 500kHz Sampling Speed, PC monitor by USB communication	
Expansion Port	Address, Data and Control signal of DSP module connected External expansion port	
Power	+5V, +12V, -12V, +3.3V SMPS Power (50W)	
Size	336 mm x 273 mm (except a bag)	

Product Features

- Using TMS320F28335 – 32bit Floating-point Operation type device of TI.
- For beginners, Peripheral block is designed to control a simple signal.
- Various control experiments using several type sensors of Photo Diode, Temperature and Ultra Sonic etc.
- Check ECG signal and Beat signal of body through Bio ECG Block.
- Provide internal Waveform Generator(1Hz ~ 100kHz) which outputs Sinusoidal/Triangle/Square wave. User can practice without the additional equipment.
- Provided Audio Codec Block to process external voice signal.
- Provided Mixer Block to output the signal by Mixing Audio signal with Waveform Generator signal.
- Provided Modulation Block to output the signal by Modulation of Waveform Generator signal with the set frequency.
- For Motor control study, Provided DC Motor Block and BLDC Motor Block.

Block Diagram



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[Appendix A] Introduction of HBE-DSPLAB Ⅱ
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Components

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Bio ECG Probe Module

USB cable (A to B Type)

AC Power Cable

User's Manual and Platform USB

RCA Cable

DSP JTAG and Cable

ECG Probe Cable

Oscilloscope Probe Cable